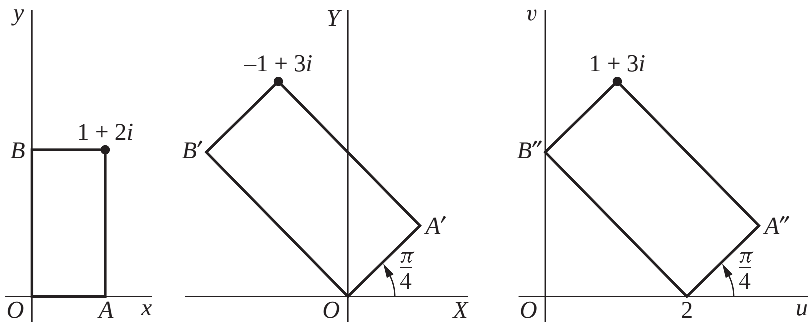

FIGURE 109
$w = (1 + i)z + 2$.

EXERCISES

1. State why the transformation $w = iz$ is a rotation in the z plane through the angle $\pi/2$. Then find the image of the infinite strip $0 < x < 1$.

Ans. $0 < v < 1$.

2. Show that the transformation $w = iz + i$ maps the half plane $x > 0$ onto the half plane $v > 1$.

3. Find and sketch the region onto which the half plane $y > 0$ is mapped by the transformation $w = (1 + i)z$.

Ans. $v > u$.

4. Find the image of the half plane $y > 1$ under the transformation $w = (1 - i)z$.

5. Find the image of the semi-infinite strip $x > 0, 0 < y < 2$ when $w = iz + 1$. Sketch the strip and its image.

Ans. $-1 < u < 1, v < 0$.

6. Give a geometric description of the transformation $w = A(z + B)$, where A and B are complex constants and $A \neq 0$.

91. THE TRANSFORMATION $w = 1/z$

The equation

$$w = \frac{1}{z} \tag{1}$$

establishes a one to one correspondence between the nonzero points of the z and the w planes. Since $z\overline{z} = |z|^2$, the mapping can be described by means of the successive transformations

$$Z = \frac{z}{|z|^2}, \quad w = \overline{Z}. \tag{2}$$